

Application Number 10/782,291
Amendment dated July 8, 2008
Response to Office Action mailed April 8, 2008

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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Original): A method comprising:

defining a flow specification data type for a routing protocol, wherein the flow specification data type allows a variable number of packet flow attributes to be specified;
generating a message that encodes traffic flow criteria in accordance with the flow specification data type; and
communicating the message to a routing device to direct the routing device to control network traffic based on the traffic flow criteria.

Claim 2 (Original): The method of claim 1, wherein defining a flow specification data type comprises defining the flow specification data type as information associated with a route advertised by the message.

Claim 3 (Original): The method of claim 1, wherein defining a flow specification data type comprises defining the flow specification data type as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 4 (Original): The method of claim 1, wherein defining a flow specification data type comprises defining the flow specification type to include a length field that indicates the number of packet flow attributes specified.

Claim 5 (Original): The method of claim 1, the flow specification data type including multiple subcomponents, wherein defining a flow specification data type comprises defining each of the subcomponents to include a subcomponent type field and a set of value fields.

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Claim 6 (Original): The method of claim 1, wherein defining a flow specification data type comprises defining a subcomponent for specifying a destination prefix.

Claim 7 (Original): The method of claim 1, wherein defining a flow specification data type comprises defining subcomponents for specifying a destination prefix, a source prefix, a protocol, a source port, a destination port, an ICMP type, and a packet length.

Claim 8 (Original): The method of claim 1, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 9 (Original): The method of claim 1, wherein defining a flow specification data type comprises redefining a preexisting data type of the routing protocol to define the flow specification data type.

Claim 10 (Original): The method of claim 1, wherein defining a flow specification data type comprises defining the flow specification data type as an application-specific data type in accordance with the routing protocol.

Claim 11 (Original): The method of claim 1, wherein defining a flow specification data type further comprises assigning an application-specific identifier to the flow specification data type to direct the router to install the traffic flow criteria within an independent routing information base (RIB).

Claim 12 (Original): The method of claim 1, further comprising:
 assigning an application-specific identifier to the flow specification data type; and
 configuring a policy to selectively enable distribution of the traffic flow criteria based on the application-specific identifier.

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Claim 13 (Original): The method of claim 12, wherein assigning an application-specific identifier comprises assigning an Address Family Identifier (AFI) and Subsequent Address Family Identifier (SAFI) to the flow specification data type.

Claim 14 (Original): The method of claim 1, wherein the traffic flow criteria specifies an appropriate action that is performed on the network packet.

Claim 15 (Original): The method of claim 14, wherein the appropriate action includes one of load balancing, rate limiting, and filtering.

Claim 16 (Original): A method comprising:
receiving a routing communication that encodes traffic flow criteria in accordance with a flow specification data type for a routing protocol, wherein the flow specification data type allows a variable number of packet flow attributes to be specified; and
controlling network traffic in accordance with the traffic flow criteria.

Claim 17 (Original): The method of claim 16, wherein controlling network traffic includes one of load balancing, rate limiting, and filtering the network traffic in accordance with the traffic flow criteria.

Claim 18 (Original): The method of claim 16, wherein the flow specification data type is defined as information associated with a route advertised by the routing communication.

Claim 19 (Original): The method of claim 18, wherein the flow specification data type is defined as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 20 (Original): The method of claim 16, wherein the flow specification data type includes a length field for specifying the number of packet flow attributes specified.

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Claim 21 (Original): The method of claim 16, the flow specification data type including multiple subcomponents, wherein each of the subcomponents includes a subcomponent type field and a set of value fields.

Claim 22 (Original): The method of claim 16, wherein the traffic flow criteria specifies an appropriate action that is performed on the network packet, wherein the appropriate action includes one of load balancing, rate limiting, and filtering.

Claim 23 (Original): The method of claim 16, wherein the routing communication further specifies a route to a network destination, the method further comprising:
 comparing the specified route to a routing information base; and
 rejecting the traffic flow criteria based on the comparison when the route does not specify a preferred path to the network destination.

Claim 24 (Original): The method of claim 16, wherein receiving a routing communication comprises communicating with a router in accordance with the routing protocol.

Claim 25 (Original): The method of claim 16, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 26 (Original): The method of claim 16, wherein the flow specification data type is encoded by redefining a preexisting data type of the routing protocol to define the flow specification data type.

Claim 27 (Original): The method of claim 16, wherein the flow specification data type is defined as an application-specific data type in accordance with the routing protocol.

Claim 28 (Original): The method of claim 16, wherein an application-specific identifier is assigned to the flow specification data type to direct the receiving router to install the traffic flow criteria within an independent routing information base (RIB).

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Claim 29 (Original): The method of claim 16, wherein an application-specific identifier is assigned to the flow specification data type.

Claim 30 (Original): The method of claim 29, wherein the application-specific identifier includes an Address Family Identifier (AFI) and Subsequent Address Family Identifier (SAFI).

Claim 31 (Original): The method of claim 16, further comprising updating a log that includes information about the routing communication.

Claim 32 (Currently amended): A network device comprising:
a control unit to generate a message that encodes traffic flow criteria in accordance with a flow specification data type, wherein the flow specification data type allows a variable number of packet flow attributes to be specified; and
an interface card to communicate the message to a routing device in accordance with a routing protocol, wherein the message directs the control unit to apply an appropriate action to network traffic based on the traffic flow criteria.

Claim 33 (Original): The network device of claim 32, wherein the control unit defines the flow specification data type as information associated with a route advertised by the message.

Claim 34 (Original): The network device of claim 33, wherein the control unit defines the flow specification data type as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 35 (Original): The network device of claim 32, wherein the control unit defines subcomponents for specifying a destination prefix, a source prefix, a protocol, a source port, a destination port, an ICMP type, and a packet length.

Claim 36 (Original): The network device of claim 32, wherein the routing protocol is the Border Gateway Protocol (BGP).

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Claim 37 (Original): The network device of claim 32, wherein the control unit redefines a preexisting data type of the routing protocol to define the flow specification data type.

Claim 38 (Original): The network device of claim 32, wherein the control unit defines the flow specification data type as an application-specific data type in accordance with the routing protocol.

Claim 39 (Original): A network device comprising:
an interface card to receive routing communication that encodes traffic flow criteria in accordance with a flow specification data type for a routing protocol, wherein the flow specification data type allows a variable number of packet flow attributes to be specified; and
a control unit to compare network traffic to the traffic flow criteria, and apply an appropriate action to the network traffic.

Claim 40 (Original): The network device of claim 39, wherein the appropriate action includes one of load balancing, rate limiting, and filtering the network traffic in accordance with the traffic flow criteria.

Claim 41 (Original): The network device of claim 39, wherein the flow specification data type is defined as information associated with a route advertised by the routing communication.

Claim 42 (Original): The network device of claim 39, wherein the flow specification data type is defined as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 43 (Original): The network device of claim 39, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 44 (Original): The network device of claim 39, wherein the flow specification data type is defined as an application-specific data type in accordance with the routing protocol.

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Claim 45 (Original): The network device of claim 39, wherein an application-specific identifier is assigned to the flow specification data type, and the control unit install the traffic flow criteria within an independent routing information base (RIB) in response to the application-specific identifier.

Claim 46 (Original): A system comprising:

a first network device to generate a message that encodes traffic flow criteria in accordance with a flow specification data type, and communicate the message to a second routing device via a routing protocol, wherein the flow specification data type allows a variable number of packet flow attributes to be specified; and

a second network device to receive the message, compare network traffic to the traffic flow criteria, and apply an appropriate action to the network traffic based on the traffic flow criteria.

Claim 47 (Original): The system of claim 46, wherein the first network device defines the flow specification data type as information associated with a route advertised by the message.

Claim 48 (Original): The system of claim 46, wherein the first network device defines the flow specification data type as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 49 (Original): The system of claim 46, wherein the first network device defines subcomponents for specifying a destination prefix, a source prefix, a protocol, a source port, a destination port, an ICMP type, and a packet length.

Claim 50 (Original): The system of claim 46, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 51 (Original): The system of claim 46, wherein the first network device defines a preexisting data type of the routing protocol to define the flow specification data type.

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Claim 52 (Original): The system of claim 46, wherein the appropriate action includes one of load balancing, rate limiting, and filtering the network traffic in accordance with the traffic flow criteria.

Claim 53 (Original): The system of claim 46, wherein the flow specification data type is defined as an application-specific data type in accordance with the routing protocol.

Claim 54 (Original): The system of claim 46, wherein an application-specific identifier is assigned to the flow specification data type.

Claim 55 (Original): A computer-readable medium comprising instructions for causing a programmable processor to:

- define a flow specification data type for a routing protocol, wherein the flow specification data type allows a variable number of packet flow attributes to be specified;
- generate a message that encodes traffic flow criteria in accordance with the flow specification data type; and
- communicate the message to a routing device to direct the routing device to control network traffic based on the traffic flow criteria.

Claim 56 (Original): The computer-readable medium of claim 55, wherein defining a flow specification data type comprises defining the flow specification data type as information associated with a route advertised by the message.

Claim 57 (Original): The computer-readable medium of claim 55, wherein defining a flow specification data type comprises defining the flow specification data type as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 58 (Original): The computer-readable medium of claim 55, wherein defining a flow specification data type comprises defining subcomponents for specifying a destination prefix, a source prefix, a protocol, a source port, a destination port, an ICMP type, and a packet length.

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Claim 59 (Original): The computer-readable medium of claim 55, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 60 (Original): The computer-readable medium of claim 55, wherein defining a flow specification data type comprises redefining a preexisting data type of the routing protocol to define the flow specification data type.

Claim 61 (Original): The computer-readable medium of claim 55, wherein defining a flow specification data type comprises defining the flow specification data type as an application-specific data type in accordance with the routing protocol.

Claim 62 (Original): The computer-readable medium of claim 55, wherein defining a flow specification data type further comprises assigning an application-specific identifier to the flow specification data type to direct the router to install the traffic flow criteria within an independent routing information base (RIB).

Claim 63 (Original): A computer-readable medium comprising instructions for causing a programmable processor to:

receive a routing communication that encodes traffic flow criteria in accordance with a flow specification data type for a routing protocol, wherein the flow specification data type allows a variable number of packet flow attributes to be specified; and
control network traffic in accordance with the traffic flow criteria.

Claim 64 (Original): The computer-readable medium of claim 63, further comprising instructions to cause the processor to control network traffic by performing one of load balancing, rate limiting, and filtering the network traffic in accordance with the traffic flow criteria.

Claim 65 (Original): The computer-readable medium of claim 63, wherein the flow specification data type is defined as information associated with a route advertised by the routing communication.

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Claim 66 (Original): The computer-readable medium of claim 63, wherein the flow specification data type is defined as network layer reachability information (NLRI) that is associated with a route advertised by the message.

Claim 67 (Original): The computer-readable medium of claim 63, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 68 (Original): The computer-readable medium of claim 63, wherein the flow specification data type is encoded by redefining a preexisting data type of the routing protocol to define the flow specification data type.

Claim 69 (Original): The computer-readable medium of claim 63, wherein the flow specification data type is defined as an application-specific data type in accordance with the routing protocol.

Claim 70 (Original): The computer-readable medium of claim 63, wherein an application-specific identifier is assigned to the flow specification data type.

Claim 71 (New): The method of claim 1, wherein generating a message further comprises encoding routing information in accordance with the routing protocol.

Claim 72 (New): The method of claim 71, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 73 (New): The method of claim 71, wherein communicating the message to a routing device to direct the routing device to control network traffic further comprises communicating the message to a routing device to direct the routing device to control network traffic based on the routing information.

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Claim 74 (New): The method of claim 16, wherein the routing communication further encodes routing information in accordance with the routing protocol.

Claim 75 (New): The method of claim 74, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 76 (New): The method of claim 74, wherein controlling network traffic further comprises controlling network traffic based on the routing information.

Claim 77 (New): The network device of claim 32, wherein the message further encodes routing information in accordance with the routing protocol.

Claim 78 (New): The network device of claim 77, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 79 (New): The network device of claim 77, wherein the message further directs the control unit to apply an appropriate action to network traffic based on the routing information.

Claim 80 (New): The network device of claim 39, wherein the routing communication further encodes routing information in accordance with the routing protocol.

Claim 81 (New): The network device of claim 80, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 82 (New): The network device of claim 80, wherein the control unit further applies an appropriate action to network traffic based on the routing information.

Claim 83 (New): The system of claim 46, wherein generating a message further comprises generating a message that encodes routing information in accordance with the routing protocol.

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Claim 84 (New): The system of claim 83, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 85 (New): The system of claim 83, wherein applying an appropriate action to the network traffic further comprises applying an appropriate action to network traffic based on the routing information.

Claim 86 (New): The computer-readable medium of claim 55, wherein generating a message further comprises generating a message that encodes routing information in accordance with the routing protocol.

Claim 87 (New): The system of claim 86, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 88 (New): The system of claim 86, wherein communicating the message to a routing device to direct the routing device to control network traffic further comprises communicating the message to a routing device to direct the routing device to control network traffic based on the routing information.

Claim 89 (New): The computer-readable medium of claim 63, wherein the routing communication further encodes routing information in accordance with a routing protocol.

Claim 90 (New): The network device of claim 89, wherein the routing protocol is the Border Gateway Protocol (BGP).

Claim 91 (New): The network device of claim 89, wherein controlling network traffic further comprises controlling network traffic based on the routing information.